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Remaining Pivot-Shift Was Observed in the ACL Reconstructed Knee with Unrepaired Lateral Meniscus Tear

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Summary:

The pivot-shift was compared between the ACL reconstructed knees with different meniscus conditions, i.e. intact, repaired and unrepaired, using a quantitative measurement. The ACL reconstructed knees with unrepaired lateral meniscus had larger pivot-shift than those with intact or fully repaired meniscus. Concomitant meniscus tear should be repaired to control the pivot-shift as much as possible.

Abstract:

Introduction

Meniscus injury is often associated with the anterior cruciate ligament (ACL) injury and aggravates the pivot-shift in the ACL injured knees. However, the concomitant meniscus tear in the ACL injured knee is not always treated by meniscal repair, because several clinical reports demonstrated no clinical advantage of the meniscal repair over meniscectomy or leaving the tear in situ. Furthermore, it is not clear if the current meniscal repair technique provides a sufficient stability. The effect of the meniscus condition on the pivot-shift in the ACL reconstructed knee is supposed to be so small that some sensitive quantitative evaluation of the pivot-shift is necessary to detect such an effect. Therefore, the purpose of this study was to compare the pivot-shift between the ACL reconstructed knees with different meniscus conditions, i.e. intact, repaired and unrepaired, using an electromagnetic measurement system.

Method

Forty-six unilateral ACL reconstructed knees were included (21men/ 25women, 25±12 y.o.). All meniscus tears, if any, were repaired except for unreparable lateral meniscus tears during the ACL reconstruction. The pivot-shift test was performed under anesthesia at one year after the ACL reconstruction. Quantitative measurement of the pivot-shift was performed using an electromagnetic system, providing tibial acceleration (m/sec²). The tibial acceleration was compared between the ACL reconstructed knees with different meniscus conditions; intact, repaired and unrepaired. One-way ANOVA and post-hoc Tukey test was used for comparison. Statistical significance was set at 0.05.

Results

Meniscus tears were found in 28 knees preoperatively; medial meniscus tear in 11 knees, lateral meniscus tear in 11

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knees and bilateral meniscus tears in 6 knees. All medial meniscus tears were repaired, while 9 lateral meniscus tears could not be repaired, leaving unrepaired 8 lateral meniscus tears. Consequently, 19 knees had repaired meniscus for either medial, lateral or bilateral sides. 9 knees with unrepaired lateral meniscus had larger rotational laxity ($0.9 \pm 0.7 \text{m/sec}^2$) compared to the meniscus intact knees ($0.5 \pm 0.2 \text{m/sec}^2$, $p < 0.05$), while the knees with fully repaired meniscus demonstrated similar rotational laxity ($0.6 \pm 0.3 \text{m/sec}^2$) to those with intact meniscus. ($p > 0.05$)

Conclusions

Unrepaired lateral meniscus could lead to increased pivot-shift postoperatively after the ACL reconstruction, whereas the ACL reconstructed knees with fully repaired meniscus had similar stability to the ACL reconstructed knees without a meniscus tear. When the meniscus tears are found, they should be repaired to the best of our ability during the ACL reconstruction not to leave the pivot-shift postoperatively.